

PHILIPPINE ZOOLOGICAL EXPEDITION
1946-1947

NOTES ON
PHILIPPINE MOSQUITOES, XIII

Four New Species of *Zeugomyia* and *Topomyia*

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The Philippine Expedition: Mosquitoes

INTRODUCTION

While collecting zoological specimens for Chicago Natural History Museum and the Philippine Museum of Natural History, the Philippine Zoological Expedition, headed by Captain Harry Hoogstraal, also collected mosquito specimens for the Nineteenth Medical General Laboratory of the United States Army. This laboratory was later renamed the Third Medical General Laboratory.

Among the many mosquitoes collected by the expedition in Mindanao were two new species of the little-known genus *Zeugomyia*, and two of *Topomyia*. Added to those previously discovered in the Philippines and described by the senior author in 1946, these new species bring to the credit of the Laboratory three of the four known species of *Zeugomyia* and five of the six known Philippine species of *Topomyia*.

The senior author wishes to thank the officers and men of the Third Medical General Laboratory mentioned in previous parts of these Notes, and also his superiors and co-workers in the Philippine Department of Health. For advice and help, the junior author is greatly indebted to Colonel Dwight M. Kuhns, Commanding Officer of the Third Medical General Laboratory, and to the successive chiefs of the Entomology Department: Captain Harry Hoogstraal, Lieutenant S. Edgar, Major T. M. Moore, and Captain C. Bruck. Full co-operation and assistance were also received from the rest of the staff of the Entomology Department: Mr. F. Gutierrez, Mr. A. Corcega, Mr. B. Escuadro, and Miss R. Trinidad. The illustrations for this paper were drawn by Mr. Eliseo Enriquez, artist, of the Malaria Division, Philippine Department of Health.

Genus ZEUGNOMYIA Leicester

The adults of the three species of *Zeugomyia* herein treated cannot be differentiated except by the characters of the male terminalia and, in the case of one species, the pupa. The females are

not separable because they lack bucco-pharyngeal teeth and their terminalia are alike. The different forms are also inseparable in the larval stage. No specimen of *Zeugomyia gracilis* Leicester, 1908, is available for comparison. This species is supposed to be present in the Philippines (Bohart, 1945). It differs from the other three species in having dark scales on all lobes of the scutellum, and the style of the male terminalia is said to be without a spine (Edwards, 1932, p. 95).

Very little is known about the habits of adult *Zeugomyia* in the Philippines. Captain Hoogstraal caught a number of females in flight in three different spots and on three different dates on the eastern slope of Mount Apo, Mindanao. The first capture totaled eighteen specimens, the second eleven, the third fifteen. As mentioned above, the females cannot be specifically differentiated. Seven male and 169 female *Tripteroides* (mostly of group B), one female *Armigeres*, and eleven females of two species of *Aedes* were caught with these *Zeugomyia*. Leicester (1908) reported that *Zeugomyia gracilis* in Malaya is a vicious biter of humans. The lone female caught in the mosquito trap at Llavac, Infanta, Tayabas, Luzon Island, in 1941, seems to indicate attraction to the pig-bait of the trap. The specimen was tentatively determined as *lawtoni*.

There seems to be little tendency for the three species of *Zeugomyia* found on Mount Apo to breed together. Captain Hoogstraal once found *aguilari* sp. nov. associated with *lawtoni*, and once with *fajardo* sp. nov.¹ Other mosquitoes associated with *Zeugomyia* in breeding were two or three species of *Aedes*, one or two of *Armigeres*, and one of *Ficalbia*. The known breeding waters of *Zeugomyia* in the Philippines are on fallen leaves of abaca and coconut; in cut bamboo and in tree-hole; in tin can (in forest, Mount Apo; collected by Captain Hoogstraal); and in axils of "anahaw" (in forest, Sierra Madre, Tayabas, Luzon; collected by Mr. P. Sunico, Bureau of Health).

***Zeugomyia lawtoni* Baisas. Figures 23, a; 24, a.**

Zeugomyia lawtoni Baisas, 1946, Bull. Philippine Bur. Health, 22: 27.

In order that comparisons can be made with the new species described herein, the characters of the male terminalia of *Z. lawtoni* are summarized as follows (based on four slide mounts):

¹ These determinations were made from males reared in the Third Medical General Laboratory.

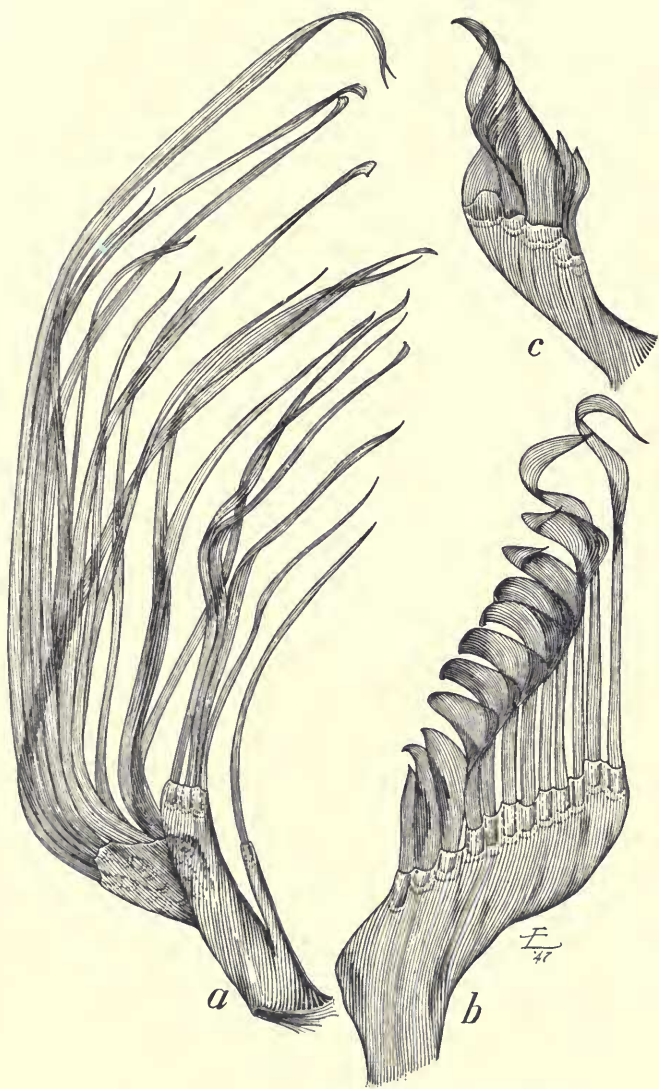


FIG. 23. Harpago of *Zeugomyia*. (a) *Z. lawtoni*; (b) *Z. aguilari*; (c) *Z. fajardoi*.

Description: Male terminalia.—Harpago exceeding the combined lengths of the coxite and style; stem definitely demarcated from the coxite and springing from the harpagonal fold; with a small sub-basal branch that bears a long narrow blade; apex of harpago moderately expanded and divided into two short branches, the inferior branch bearing four or five long, narrow, partly twisted blades, the superior branch surmounted by a group of nine to fourteen narrow, long blades. Sub-basal lobe of coxite divided into two separate processes; only one long internal blade; median blades longer, tips bent, seven in number, reaching the apex of the coxite, the seventh or most external arising from a separate prominent tubercle; base of outer long external blade far above (posterior to) that of the inner; no rods beneath the median blades. A row of five or six golden blades at the apex of the sternal surface of the coxite close to the base of the style. On the tergal side opposite is another row of about six very much shorter rods or blades. Style short, fairly stout, dark, irregularly shaped, with a strong subterminal spine that is flattened, dark, round-ended, and inserted obliquely, forming an angle of about 45 degrees with the stem of the style (in mounted preparations it often appears bent and pointed posteriorly); style also bearing a few short stiff hairs. Tergite IX narrow at middle and broad on either side; submedially, with from two to ten bristles on each side. Sternite IX with a few scales and from eight to ten bristles.

Zeugomyia aguilar sp. nov. Figures 23, *b*; 24, *c*; 25, *a*; 26, *c* and *d*.

Adult females indistinguishable from *lawtoni* and *fajardo*. Similar to *lawtoni* in the male terminalia in that both have: (1) the sub-basal lobe of the coxite divided, or with a tendency to be divided, into two separate processes; (2) a row of five or more golden blades at the apex of the sternal surface of the coxite close to the base of the style; and (3) a large number of harpagonal blades (from nine to fourteen in *lawtoni*, from ten to fifteen in *aguilar*). The male terminalia differ from those of *lawtoni* in that the harpago is smaller, the stem arises directly from the inner surface of the coxite, the apex is more expanded and is not twisted into branches, and the longest three or four blades, in their natural position, are twisted together like the strands of a rope; the median blades of the sub-basal lobe of the coxite are five in number, and the external blade is not so far above that of the inner as in *lawtoni*; and sternite IX lacks scales. The larva is indistinguishable from that of *lawtoni*.

The pupa, in general, differs from that of *lawtoni* in having more spicules scattered over the surface of the paddles and fewer branches of tufts on abdominal segments VII to VIII, but these differences are not definitely diagnostic.

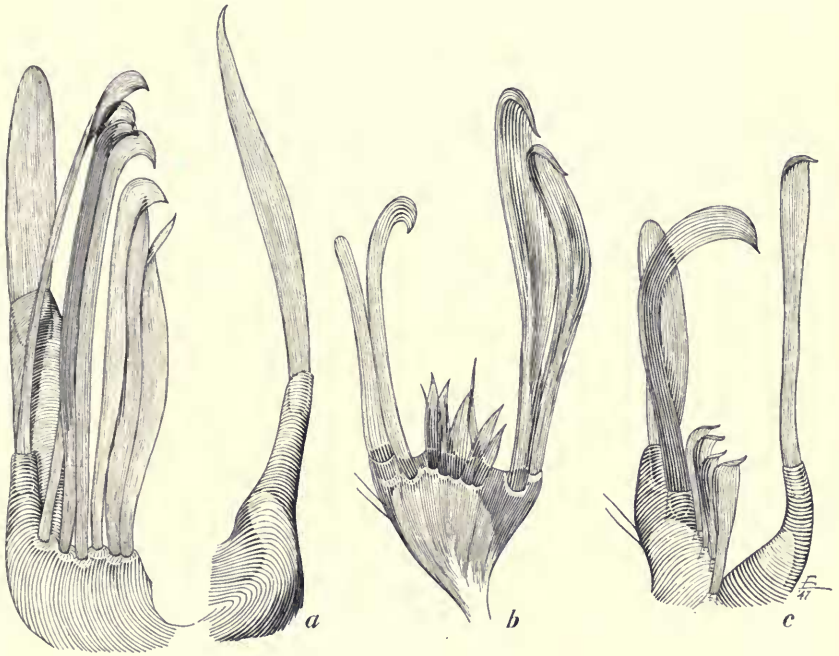


FIG. 24. Sub-basal lobe of coxite. (a) *Zeugomyia lawtoni*; (b) *Z. fajardoi*; (c) *Z. aguilari*.

The following description of the adult is based upon five males and thirteen females; that of the male terminalia is based upon five slide mounts; those of the larva and pupa are largely based upon skin mounts of the males. Since the color markings of the adult are the same for *lawtoni*, *aguilari* sp. nov., and *fajardoi* sp. nov., the adult description applies to all.

Description: Adult.—Head clothed with flat scales; a few upright ones present posteriorly. In front of vertex, a triangular silvery patch that extends as a fairly broad line on either side bordering the eyes and widens into a patch lower down. The remaining parts dark. Silvery, flat scales on torus; flagella and verticils of antenna dark; plumose as usual in male, not in female. Clypeus dark, bare. Palpi dark, hairy, somewhat variable in length, equal to

about $1\frac{1}{2}$ times the length of the clypeus. Proboscis dark, of the usual type, also variable in length but longer than the front femur.

Scutal integument dark; scales narrow, dark, not very dense. Two or three pairs of dorso-central bristles and two of pre-scutellars. Numerous strong supra-alars. Immediately above and in front of the supra-alar bristles a broad line of large, silvery scales, the line continued downward through the paratergite, the post-spiracular area and the sterno-pleuron to mid-coxa. Scutellar scales broad, flat, silvery on lateral lobes, with a mixture of one or two dark scales; dark on the mid-lobe. Three or four dark bristles and one or two weaker ones on the lateral lobe; usually four on the mid-lobe. Postnotum dark, bare. Silvery patch of broad scales and about half a dozen dark bristles on *apn*; dark, flat scales and two or three brown or dark-brown bristles on *ppn*. Without spiracular bristle; one post-spiracular. One or two upper and two or three lower sterno-pleural bristles. Five pre-alars. About five upper and one strong, tawny, lower mesepimeral. A patch of silvery scales and three tawny bristles on propleuron. A similar patch on each coxa. Upper margin of meron slightly above level of hind coxa. Prosternum with a small patch of silvery scales on either side, this being partly a continuation of the silvery patch on the propleuron. Besides, there are a few such scales on the lower margin of the prosternum (a common character in the three species). Legs dark; a pale line on under side of fore- and mid-femora; that on the under side of the hind femur broader and extending as a narrow basal band on the dorsal side. Claws of fore- and mid-legs unequal in males, the larger with a tooth. Abdominal tergites dark-scaled; silvery patches covering lateral sides of I; similar but triangular and basal patch on sides of II to VII; that on VII continued as a broad basal band on dorsal surface. Those on IV to VI may also form complete basal bands or with interruptions of dark scales at middle; VII dark. Sternites (fresh specimens) I to VII dark, with broad white basal bands; VIII dark. In dry specimens most of the sternites are infolded within the tergites, thereby showing triangular median silvery patches formed by the contact of the two sides of the tergites. In males the group of golden blades at the apex of the coxite is visible, in contrast to the dark tip of the abdomen. Female terminalia retractile.

Male terminalia (figs. 23, *b*; 24, *c*; 25, *a*).—Stem of harpago arising directly as a lobe from inner surface of coxite, though it

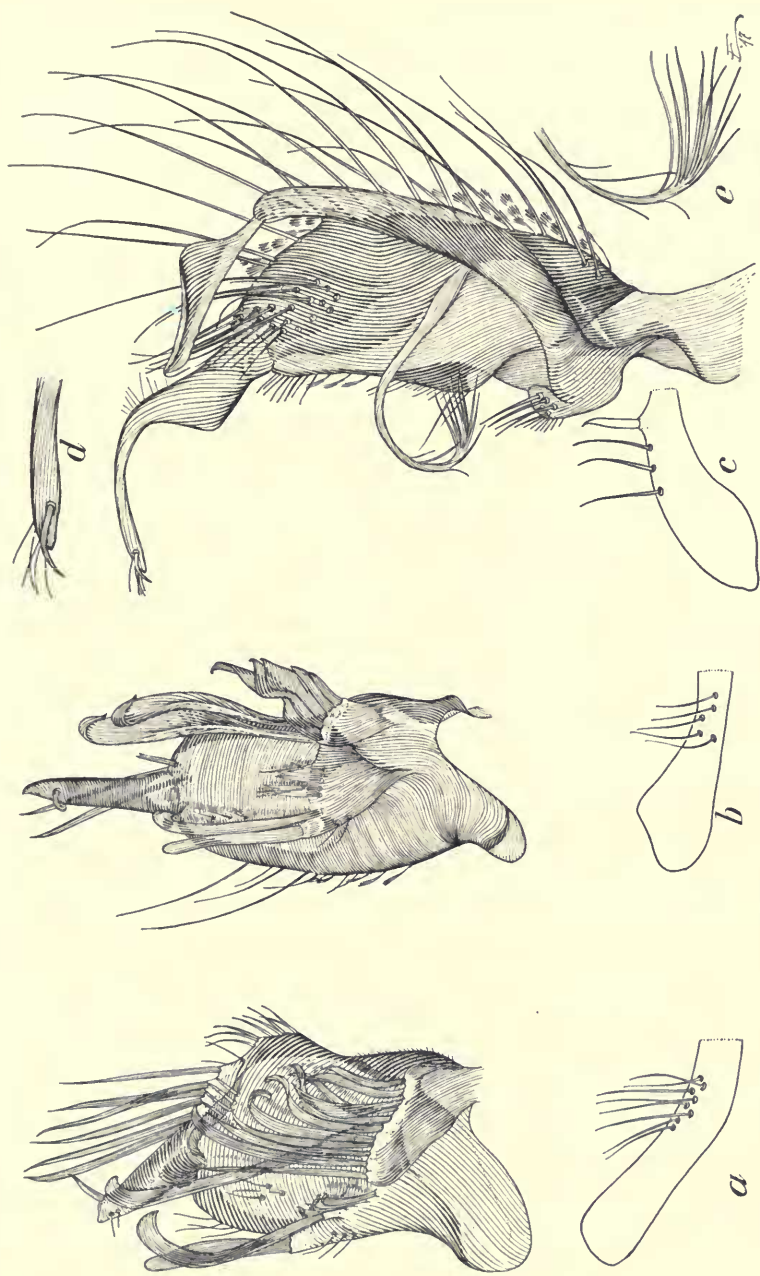


FIG. 25. Parts of male terminalia. (a) *Zeugomyia aguilaris*. (b) *Z. fajardoii*. (c-e) *Topomyia hernandoi*; (d) tip of style, and (e) tip of internal appendage. (Outlined figures represent half of tergite IX.)

is also connected with the harpagonal fold. Apex more expanded than that of *lawtoni*, but not divided into branches, bearing a single row of ten to fifteen broad, twisted blades. In their natural position the longest three or four blades are twisted together like a rope (fig. 23, *b* from isolated flat preparation). Sub-basal lobe of coxite divided, similar to that of *lawtoni* (cf. *a* and *c*, fig. 24) but with median blades, except one, very much shorter and base of external blade not as far above that of inner as in *lawtoni*. No rods beneath median blades. A row of golden blades at apex of sternal surface of coxite close to base of style. Style as in *lawtoni*. Tergite IX with five to ten bristles on either side (the number on one side seldom the same as the count on the other in any of the three species herein discussed). Sternite IX with three to eleven bristles; without scales.

Pupa (fig. 26, *c*, *d*).—Respiratory trumpet moderately long and stout, deeply notched. Metathoracic (metanotal of Rozeboom and Knight, 1946, p. 128, pl. IV) hairs all simple. *P* much longer than *R* and *O*. Dendritic tuft on abdominal segment I moderately developed, with eight to twelve subplumose branches. *A* tiny and single on segments I to VI; subplumose tufts on VII and VIII branched respectively into three or four, and five to ten. *B* the longest hair on most segments, very similar to *K-I*, single, sparsely and minutely frayed. *C-II* similar to *B-II*, but *C* of other segments much shorter, single or split into two branches, progressively increasing in length on each succeeding segment, that on VII nearly as long as *A-VII*, though single but sometimes with two branches, frayed. Paddle with a double row of border hairs, the secondary row being composed of shorter hairs, some of which are reduced to fairly long spines. Paddle hair long, single, mid-rib conspicuous.

Larva.¹—Head more or less rounded, brownish. Feeding brushes thick, mostly pectinate. Preclypeal spines or the modified hair no. 1 fairly long, simple, brownish; no. 2 about as long but slender, branched close to base into three to six; nos. 3 and 4 very tiny, as usual for culicines, but no. 3 more forward in position; no. 5 similar to no. 1 but longer; no. 6 far behind no. 5, simple, longer but more slender than no. 5; no. 7 like no. 2 but slightly weaker, branched close to base into two or three; no. 8 much weaker, simple or split into two; no. 9 similar to no. 8; no. 10 fairly stout, simple; no. 11

¹The larval hair designations used herein are the same as those proposed in Part XVI of these Notes (in press).

arising well above the middle of the antennal shaft, simple, slightly longer than no. 10; no. 12 fairly long, branched into two or three; no. 13 weaker, simple, sometimes split near the apex into two; no. 14 like no. 13, simple; no. 15 similar to no. 12; no. 16 apparently absent; no. 17 longer than no. 12, branched basally into four to six; no. 18 most developed of the ventral hairs, branched into four to

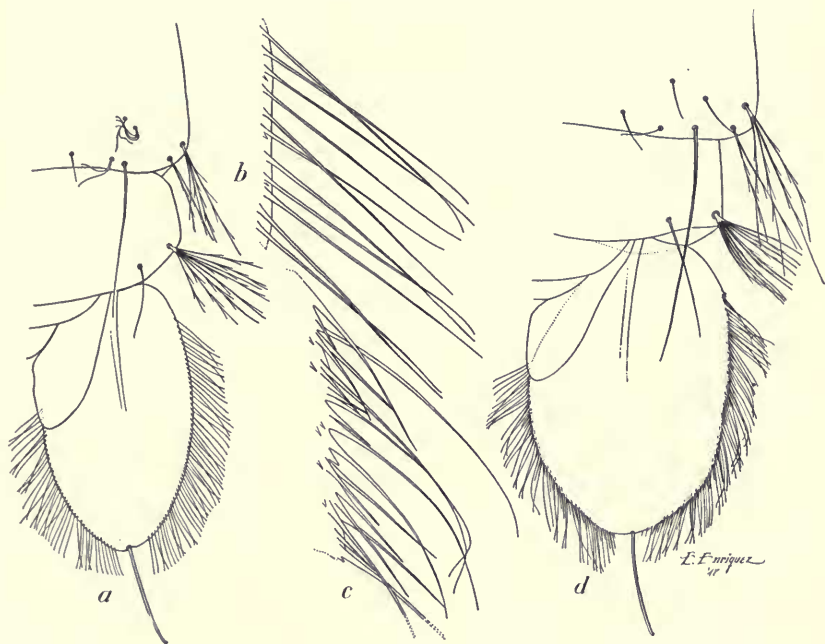


FIG. 26. Parts of pupa. (a) Paddle and parts of segments VII and VIII, and (b) enlarged portion of external border of paddle of *Zeugomyia fajardoi*; (c and d), same for *Z. aguilari*.

seven; no. 19 apparently absent; no. 20 weak, with about four or more slender lateral branches.

Prothoracic hair 0 weak, having three or four branches; nos. 1 to 3 arising from a small common plate; no. 1 much longer than nos. 2 and 3, split basally into two or three branches, frayed; no. 2 simple; no. 3 shorter than no. 2, simple or two-branched; no. 4 about equal to no. 3, two-branched; no. 5 similar to no. 1; nos. 6 and 7 the longest of the prothoracic hairs, frayed; no. 6 simple; no. 7 split near the base into two subequal branches; hair 8 similar to no. 4. Pleural hair group weak, much shorter than either the meso- or the meta-hair groups; no. 9 the longest hair in the group, simple

or branched (shorter when branched); no. 10 about half as long as no. 9, simple; no. 11 nearly one-third the length of no. 10, branched sub-basally into two or three; no. 12 about one-half as long as no. 10, simple; no. 13 longer than no. 8, with three or four branches. Mesothoracic hair 1 weaker than prothoracic no. 1, split basally into about five branches; no. 2 much weaker, two-branched; no. 3 longer, simple; no. 4 less than half the length of no. 3, two-branched; no. 5 very long, frayed, simple; nos. 6 and 7 arising from a common plate; no. 6 about equal to no. 5, frayed, branched from base into three or more; no. 7 a little shorter, simple, frayed; no. 8 like no. 6, with four or five branches. Mesopleural group much more developed than the pro-pleural group; no. 9 long, fairly stout, frayed, split very close to the base into three or more equal branches; no. 10 nearly twice as long, simple, frayed; no. 11 very tiny, simple; no. 12 similar to no. 10; no. 13 weak, with about five branches; no. 14 like no. 13. Metathoracic hair 1 weaker than meso-hair 1, having from three to five branches; no. 2 slightly longer, two-branched; no. 3 shorter, split into three or more branches; no. 4 similar to no. 2; no. 5 about as long as no. 4, simple or branched; no. 6 slightly longer, simple; no. 7 well developed, frayed, having about half a dozen equal branches; no. 8 short, with four or five branches. Metapleural group: nos. 9 and 10 similar to mesopleural nos. 9 and 10, but slightly longer; no. 11 very tiny, simple; no. 12 reduced to only about one-sixth the length of no. 10, slender, simple; no. 13 similar to mesopleural no. 13, with four or five branches.

Abdominal hair 0 the most anterior of the dorsal hairs, tiny, simple; no. 1 fairly developed, progressively increasing in length on each succeeding segment, that on segment VII three or four times as long as that on I, each split into two to four branches; no. 2 short, anterior and external to no. 1 on segment I, anterior and internal to no. 1 on succeeding segments, two-branched; no. 3 a little longer than no. 2, but slightly increasing in length on each succeeding segment, each with three to five branches on segments I and II, with only two or three branches on the other segments; no. 4 about as long as no. 3, with about four branches on segment I, much longer on II and increasingly so on succeeding segments, single or split into two; no. 5 a little longer than no. 4, with about four branches on segment I, considerably longer and with three or four branches on the other segments; no. 6 (*lh*) moderately long, frayed, with four or five branches on segments I to IV, with only two branches on V and VI, shorter on VII but with three or four branches; no. 7 nearly as long as no. 6 on seg-

ments I and II, frayed, split from base into two, very much reduced and farther down (ventral) on other segments, each with three or four branches; no. 8 far anterior to no. 6, tiny, two- or three-branched; no. 9 similar to no. 6 but shorter, ventral and closely anterior to no. 6 instead of posterior as usual, each with usually three branches, frayed; no. 10 absent on segment I, tiny, with two or three branches, variable in position on other segments; no. 11 absent on segment I, fairly long on other segments, single; no. 12 (absent on segment I) similar to no. 10; no. 13 present on segment I, fairly developed, about as long as no. 1, each with four to six branches, increasing in length on each succeeding segment; 14 apparently absent. Comb of about eight to ten teeth in a row, each tooth pointed, dark, with tiny, spicule-like serrations on either side of bulbous base. Anal segment short, largely but not completely enclosed by plate with five to ten large and small teeth along the posterior border on either side, between the *osc* and *lh*, aside from tiny, grouped spicules on lateral surface. Saddle teeth variously serrated. *Isc* long, not frayed, split close to base into three or four branches. *Osc* longer, not frayed, split into two. *Lh* somewhat shorter than *isc*, single, coarsely frayed. Fan composed of four pairs of hairs (the shortest may be unpaired), not frayed, each with two to five branches. Papillae longer than, but not quite as broad as, the siphon, and broadly lanceolate at tips. Siphon stout and moderately long, the tuft arising above middle, not frayed, with two to four branches. Five to eight pointed pecten teeth, not serrated; a very small basal tooth sometimes present.

Holotype.—A male (Lot no. P1133-3), with larval and pupal skin mounts, from the forest on the eastern slope of Mount Apo, Davao Province, Mindanao, at about 2,900 feet elevation. Collected as a larva in a tin can, September 11, 1946, by Captain H. Hoogstraal and sent by air to the Third Medical General Laboratory, where it was reared. To be deposited in the collection of the United States National Museum.

Allotype.—A female (Lot no. P1133-5), with larval and pupal skin mounts, same data as the holotype. To be deposited in the collection of the United States National Museum.

Paratypes.—Four males and twelve females, one of the males and three of the females with skin mounts. Several of the paratypes with the same data as the holotype. One male and certain other of the females from the same locality, at about 3,000 feet elevation, collected August 17, 1946, by Captain H. Hoogstraal.

One male and two female paratypes in the collection of the Philippine Department of Health, the rest to be deposited in the collection of the United States National Museum.

Remarks.—A male *lawtoni* was associated with the specimens collected on September 11, 1946; thus some of the females may also be that species.

The new species is named in memory of Dr. Eusebio Aguilar, Director of Health, who was one of the victims of the last war.

***Zeugomyia fajardoi* sp. nov.** Figures 23, *c*; 24, *b*; 25, *b*; 26, *a*, *b*.

The male terminalia of this species are easily distinguished from those of *aguilari* and *lawtoni* by the small harpago and the small number of harpagonal blades; the undivided sub-basal lobe of the coxite; the strong bristles beneath the median blades of the sub-basal lobe; the small number of golden rods at the apex of the sternal surface of the coxite; and the presence of a short rod at the apex of the tergal surface close to the base of the style. The pupa is distinguished by the single row of border hairs (as opposed to a double row) along the paddles. The basal half of the antenna of the larva is dark.

Description: Male terminalia (figs. 23, *c*; 24, *c*; 25, *b*) (based on two slide mounts).—Harpago not branched, much smaller than that of either *lawtoni* or *aguilari*; bearing only five blades (from thirteen to nineteen in *lawtoni*, from ten to fifteen in *aguilari*), these blades much smaller than in the other two species; three of the blades twisted; the most external blade (i.e., the most apical) the longest, broad toward the base and toward the apex but narrow at middle. Sub-basal lobe of the coxite definitely a single process, bearing two long internal, two long external, and five short median blades, and three strong bristles beneath the median blades. Only two golden rods at the apex of the sternal surface of the coxite (as opposed to five or more in *lawtoni* and *aguilari*), and in addition a short rod with emarginate tip at the apex of the tergal side close to the base of the style. Tergite IX with two to six bristles on either side (two to ten in *lawtoni* and five to ten in *aguilari*). Sternite IX without scales, with only four bristles (eight to ten in *lawtoni*, three to eleven in *aguilari*).

Holotype.—A male (Lot no. P1108-3), with larval and pupal skin mounts, reared from larva collected in a tree-hole in original forest, about 3,600 feet altitude, on the eastern slope of Mount Apo, Davao Province, Mindanao. Collected August 19, 1946, by

Captain H. Hoogstraal. To be deposited in the collection of the United States National Museum.

Paratype.—A male (Lot no. P1136-y), without skin mounts, reared from a larva collected in a trough in a log at about 3,500 feet altitude, same locality as the type. Collected September 15, 1946, by H. Hoogstraal. In the collection of the Philippine Department of Health.

Remarks.—Among the females with associated skins that were bred out of the same lots as the holotype and paratype, none shows the pupal and larval characters of the holotype. A male *aguilari* was also reared from the same lot as the paratype of *fajardoi*. With the exception of the differences noted above, the descriptions for the adult, pupa, and larva of *lawtoni* or *aguilari* are applicable to *fajardoi*.

The species is named in memory of Dr. Jacobo Fajardo, the second Filipino Director of Health.

Genus *TOPOMYIA* Leicester

If it were not for the broad apical band or patch on abdominal tergite II in both sexes, the following new species would appear to be Ludlow's *Kingia gregoryi*. If it were not for that, too, and for the difference in two details of the male terminalia, it would seem to be Leicester's *Topomyia argyropalpis*. Because the male was unknown, Edwards in 1922 provisionally declared *gregoryi* to be a synonym of *argyropalpis*. Dyar and Shannon (1925) agreed with Edwards' opinion.

Topomyia dejesusi sp. nov. Figure 27, a, b, e.

Very close to *argyropalpis*, but the male of that species as described by Leicester (1908, p. 243) does not have white lateral spots on the abdominal tergites (as does *dejesusi*) or a patch or band on tergite II. The male terminalia of *argyropalpis*, as illustrated by Edwards (1922, pl. 8, fig. 8), has both forks of the harpagonal appendages pointed, and no large spine is shown on the tergal surface, subapically, of the coxite. In *dejesusi* the lower fork of the harpagonal appendage is broadened and round-ended, while a prominent spine is located subapically on the tergal surface of the coxite.

For the following information regarding these and other differences, we are indebted to the respective authorities in the United

States National Museum and in the British Museum (Natural History). Dr. A. Stone (letter of December 10, 1946) writes: "Your *Topomyia dejesusi* does fail to agree with *Kingia gregoryi* in that the latter lacks the apical white band on the second abdominal tergite, just as you thought. The palpus of *gregoryi* is also scarcely longer than the clypeus, whereas you write that it is somewhat longer than twice as long as the clypeus in *dejesusi*." Dr. P. F. Mattingly writes: "I have examined the terminalia of the type male of *Topomyia argyropalpis* Leicester, and find them to differ from those shown in your drawing in lacking the large triangular spine on the inner face of the coxite, in having a small basal lobe on the coxite in place of the long hairs which you show, and in the shape of the appendage to the harpago which has one arm bent almost through a right angle. The abdomen of the type male of *T. argyropalpis* is missing except for a small portion which is mounted with the terminalia. It appears clear to me that yours is a different species from *argyropalpis*." Dr. Mattingly also sent sketches to us which are reproduced here (fig. 27, c, d). These were drawn, according to him, after he re-mounted the terminalia.

In other details of the genitalia, *argyropalpis* and *dejesusi* are remarkably similar, indicating close relationship though perhaps they are not conspecific.

Description: Adult.—A broad triangular silvery patch covering anterior part of vertex, and a similar patch low down on either side of head; no pale line bordering eyes between silvery patches. Torus dark brown, bare; antennal flagella and verticils of similar hue. About six to eight verticils on each flagellum in male, four to six in female. Clypeus dark brown, bare. Palpi about twice as long as clypeus in male, somewhat longer in female, silvery-scaled except basal portion beneath clypeus. Proboscis dark, moderately swollen toward apex, about as long as front femur in male, somewhat shorter in female; a pale-golden line underneath, broader and more conspicuous in male than in female, originating from base of proboscis where the line is fairly broad, gradually tapering toward the apex, and ending at about one-eighth of the distance from the tip of the proboscis. *Apn* dark, covered with dense patch of broad silvery scales, and about ten dark brown bristles. *Ppn* also dark, with iridescent silvery scales; one strong bristle in male, detached or absent in female. Prosternum dark brown, bare except that on either side a narrow portion is overlapped by silvery patch of flat scales originating from propleuron. A brown propleural

bristle in female, detached or absent in male. Scutal integument dark; scales dark brown, narrow, with the usual silvery line of broad, roundish scales at middle running from anterior border and ending at level of wing root in both sexes. Without dorso-central or pre-scutellar bristles; several rather short supra-alar bristles. Scutellum dark brown, paler in male; scales broad, flat; silvery on mid-lobe (the silvery patch encroaches on part of posterior

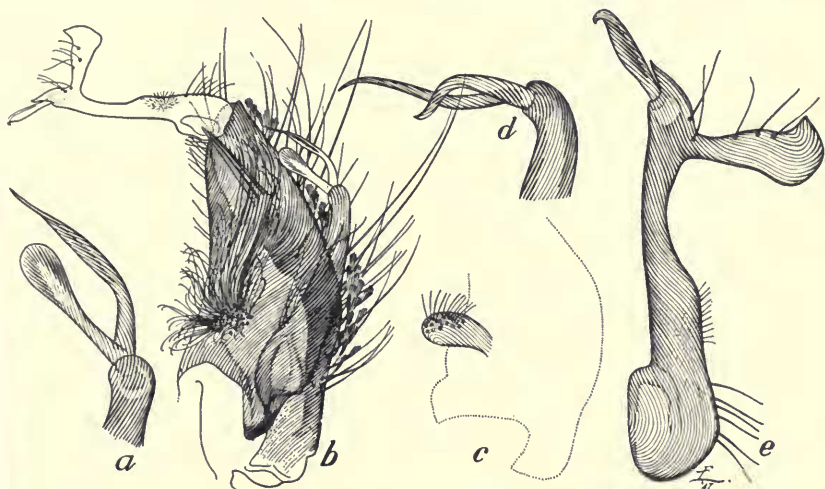


FIG. 27. Parts of male terminalia. (a) Tip of harpago, and (b) coxite and style of *T. dejesusi*. (c) Basal lobe of coxite (shaded), and (d) tip of harpago of *T. argyropalpis* as sketched by Dr. P. F. Mattingly. (e) Style of *T. dejesusi*.

border of scutum, particularly in the female, where the scales are also broad), dark on lateral lobes, a few white ones mixed with dark scales in female. Postnotum dark brown, bare. Pleurae dark brown. A large triangular silvery patch of broad scales covering entire post-spiracular and sub-spiracular areas, the sterno-pleuron, (except the anterior of its lower half), and continuing to anterior of mesepimeron. Small patch of similar scales on each coxa. Paratergite dark, bare. Pleural bristles mostly detached; only three spiraculars and six to eight upper mesepimerals are left. Legs dark; under sides of femora pale in male, that on mid-leg continued to under side of tibia; that on hind leg continued through tibia to last tarsal segment. Pale parts on under sides of legs in female not conspicuous. Wings dark. Abdominal tergite I silvery-scaled on sides, the white part extending slightly to the dorsal surface;

lateral sides of tergite II also silvery-scaled, but this extending as a broad sub-apical band in the female, the dorsal patch on the male not quite connected with the patch on the side. A few dark scales at middle of apical border dorsally render the silvery band not strictly apical. A broad silvery patch on either side of tergite III; patches on IV to VI extend upwardly, forming narrow triangle, probably with its tip visible above in fresh specimens (the dry specimens have laterally compressed abdomen); VII and VIII dark in female, only VIII dark in male. Sternites pale golden except VIII, which is dark.

Male terminalia (fig. 27, *a, b, e*).—Tergite IX with fairly straight posterior border (without lobes), having on either side a row of five bristles which are bent and pointing outwardly, the outermost being stouter and longer than the others. Harpago with a stout, slightly bent stem, about two-thirds the length of the coxite; with a terminal appendage which is split in two close to base, the upper fork longer, pointed, bent, and the lower shorter and straight, its tip expanded and round-ended. Coxite with a big cluster of long, bent hairs springing from an ill-defined lobe at the base of its inner surface. Numerous scales and long hairs on sternal surface. A conspicuous spine subapically located on tergal surface; or, rather, it seems a fusion of two strong spines. Style irregularly sculptured, enlarged toward the base, where it bears many tiny hairs, and split in two at apex; the external fork irregularly expanded at tip and bearing several long hairs along its internal border; the internal fork bearing a terminal spine which is dark, subapically expanded, with a pointed, hooked tip; a few hairs on the fork. Paraproct dark-brown, surmounted by a strong, dark, pointed tooth.

Pupa, larva, and egg.—Unknown.

Holotype.—A male (Lot no. P1334-x) from the eastern slope of Mount Apo, Davao Province, Mindanao. Caught wild by Captain H. Hoogstraal at about 3,500 feet altitude, October 26, 1946. To be deposited in the collections of the United States National Museum.

Allotype.—A female, same locality as the type. Caught wild by Captain H. Hoogstraal at about 3,100 feet altitude, October 2, 1946.

Remarks.—*T. dejesusi* is named in memory of the first Filipino Director of Health, Dr. Vicente de Jesus, who succeeded the famous Dr. Victor Heiser.

Topomyia hernandoi sp. nov. Figure 25, *c, d, e*.

Description: Adult male.—Head apparently marked as in the other species of *Topomyia*, that is, with a silvery patch in front of the vertex and another low down on either side.¹ Torus, antennae, clypeus, and palpi dark, of normal type for genus. Eight to ten verticils on each flagellar segment of antenna. Proboscis somewhat shorter than front femur, dark, moderately swollen toward apex; base with a golden patch that narrows on under side, forming a short line that terminates a little beyond level of palpal tip. The golden patch not readily visible. Integument of scutum dark brown, scales of similar color, narrow. The usual line of broad roundish scales at middle, originating from anterior border and terminating close to anterior border of mid-scutellar lobe. Three or four pairs of dorso-central bristles; several pre-scutellars; several supra-alars. Scutellar scales broad, flat, silvery on mid-lobe, dark on lateral lobes; two strong bristles on each of lateral lobes, four on mid-lobe. *Apn* dark brown, covered with the usual broad silvery scales and dark bristles. *Ppn* dark brown, completely but not densely covered with dark brown (reflecting changing hues), broad scales; one strong bristle. Pleural integument brownish, the usual patch of silvery scales covering post- and sub-spiracular areas, the larger portion of the sterno-pleuron and the mesepimeron. A small patch of silvery scales and two strong tawny bristles on propleuron. Two or three spiracular bristles, and about half a dozen upper mesepimerals, but other bristles detached or absent. Legs dark; pale yellowish line underneath each femur, that on hind leg continued to tip of last tarsal segment. Wings dark. Outstanding scales on stem of vein 2 long, blunt-ended. Base of *af* nearer root of wing than that of *pf*. Abdominal tergites clad with dark brown scales; sternites pale yellowish except VIII, which is dark.

Male terminalia (fig. 25, *c, d, e*).—Tergite IX arch-like, with a pair of sub-median strong spines arising from small tubercles. External to the spine is a row of three bristles on the left side and two on the right. Bristles about as long as spines. Harpago strong, its stem about as long as coxite, its base bulbous, spiculed, its terminal appendage leaf-like. Coxite with a row of 15–16 very strong hairs along external border; numerous scales on sternal surface. A long, curved process with its tip divided into about a dozen delicate, thread-like branches, arising a little below middle of internal

¹ The holotype is a unique and a fairly good specimen, but the scales on the head are affected by paraffin, which obscures the silvery patches. Only under certain angles of lighting can traces of these silvery patches be seen.

surface. On tergal side an elongate apical lobe bearing many strong spines and several bristles. Sub-basal lobe of coxite (basally located in this species) bears two strong, unequal bristles and several weaker ones. Basal half of style expanded, with short hairs on enlarged portion; bent at about the middle from where it tapers to apex; terminal spine short, dark; a few hairs near the spine. Paraproct tapering toward its dark apex, which bears two teeth. Phallosome with many small close-set teeth on lateral plates.

Holotype.—A male (unique) (Lot no. P1336) from the eastern slope of Mount Apo, Davao Province, Mindanao, original forest, about 5,750 feet elevation. Caught in flight by Captain H. Hoogstraal and Lieutenant D. Heyneman, November 8, 1946. To be deposited in the collection of the United States National Museum.

Remarks.—The name is in honor of Dr. Eugenio Hernando, the third Filipino Director of Health.

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